

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 May 2002 (02.05.2002)

PCT

(10) International Publication Number
WO 02/35778 A1

(51) International Patent Classification⁷: **H04L 12/56, H04Q 7/38, H04L 12/58**

(21) International Application Number: **PCT/SE01/02327**

(22) International Filing Date: 24 October 2001 (24.10.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0003885-1 24 October 2000 (24.10.2000) SE

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

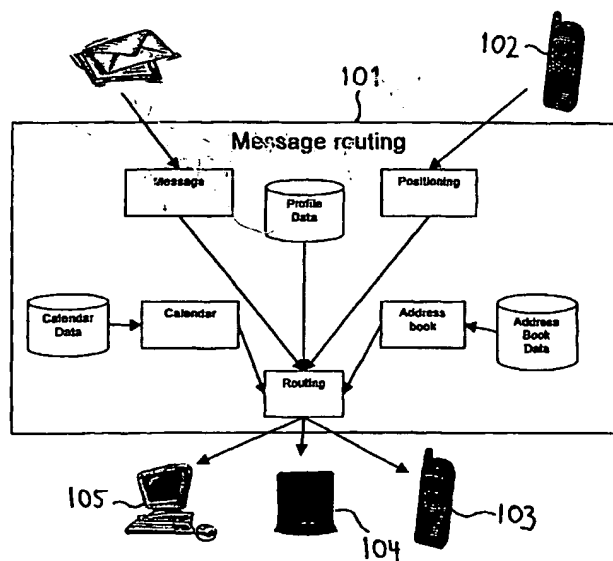
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

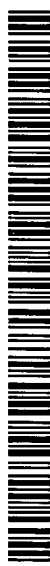
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A MULTI DEVICE ROUTER



(57) Abstract: A method and apparatus for routing a message sent from a source to an intended destination in a communication network, wherein the position of a predetermined mobile communication device connected to the network and available for a user, which is associated with the destination, is determined, the type and the size of the message is analysed, a personal profile of the user stored in a node in the communication network is analysed for selecting which one of a number of destinations or communication devices, connected to the network and available for the user, being the most suitable destination to route the message to, with respect to the position of the mobile communication device and the type and size of the message, and the message is routed to the selected destination or device.



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A MULTI DEVICE ROUTER

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Field of the Invention

The present invention relates to a method and apparatus for routing a message in a communication network sent from a source to an intended destination, and more particularly to a method and apparatus for routing a message sent from a source to an intended destination to a suitable destination depending on the position of a user of the intended destination in a communication network.

15 Description of the Prior Art

People become users of more and more electronic communication devices and services with a number of messages being sent to different devices and different addresses. This message flow results in difficulties for a user to have control over the information. In a particular case, a user has access to a mobile phone, a computer at the office, and a computer at home. The both computers are connected to the Internet and the user has an email address accessible from the home computer and a work related email address.

During a working day the user has to go home at lunch and does not come back to work until the next day. However, an important email is received at the work related email address and the user does not know anything about the mail. This problem can be solved by forwarding all messages received at the working related email address from the computer at the office to the email address accessible from the computer at home. However, the user may forget to set the mail system at the office to forward all incoming emails to the email address accessible from the computer at home. In this case the user can call the office and ask a

colleague to make the setting at his email account. This implies that the user has to disclose his password to the colleague to get access to his email account. If the user does not want to disclose his password to anybody else or
5 if no one is available at the office the user will not be aware of the important email until he comes back to the office the next day.

The situation will be even more complicated if the user goes on a business trip and takes his PDA with him on
10 the trip and the work related emails are re-routed to the home email address. If the user only has access to a third email account, he can not read email sent to the office.

However, if the user has remembered to forward the work related email address to the address accessible from
15 the PDA and he loses the PDA it could be difficult to get access to the emails.

Summary of the Invention

The object of the invention is to provide an improved
20 method and apparatus for routing a message sent from a source to an intended destination to a suitable destination depending on the position of a user of the intended destination in a communication network.

In order to achieve said object the invention provides a method, wherein the position of a predetermined
25 mobile communication device connected to the network and available for a user, which is associated with the destination, is determined, the type and the size of the message is analysed, a personal profile of the user stored
30 in a node in the communication network is analysed for selecting which one of a number of communication devices, connected to the network and available for the user, being the most suitable device or address to route the message to, with respect to the position of the mobile
35 communication device and the type and size of the message,

and the message is routed to the selected destination or device.

Another aspect of the invention is to provide a routing device for routing a message according to the
5 method.

An advantage of the invention is the ability to make intelligent decisions of routing messages to communication devices available to a user on different locations.

10 **Brief Description of the Drawings**

An illustrative embodiment, advantages and features of the invention will now be described with reference to the accompanying drawings, in which

FIG 1 shows a block diagram of a multi device router
15 according to a first embodiment of the invention,

FIG 2 is an illustrative view of the signalling between network devices according to a first embodiment of the method for message routing according to the invention, and

20 FIG 3 is an illustrative view of the signalling between network devices, according to a second embodiment of the method for message routing according to the invention.

25 **Detailed Description of the Invention**

Referring to FIG 1 in the drawings, there is shown a block diagram of a multi device router (MDR) or routing device 101 according to the invention. The MDR has interfaces to communication devices such as a mobile phone
30 102, 103, a PDA 104, PC 105, etc. Further, it has the ability to handle any type of message: voice, email, SMS or other short messages, multimedia, voice over IP, SIP address, mobile address, or IP address and the ability to make intelligent decisions of routing messages or any kind
35 of data stored information to communication devices

available for an end user. The mobile position can be collected from any kind of positioning determining system.

With an MDR according to the invention, contacting a person is convenient. A sender just needs to know one of
5 the possible addresses to the receiver of the message. The MDR routes the message to the most suitable communication device or address for that person. Additionally, the MDR gives a confirmation of reception back to the sender. This is, however, not necessary in an alternative embodiment of
10 the invention.

A first embodiment of the method according to the invention, wherein an email is sent from one station and is received in another station, i.e email to email, is described in connection with FIG 2.

15

1. "A" sends an email to "B".

2. A request is sent to the MDR to find out where "B" is.

3. The MDR sends the position request to the
20 positioning center.

4. The positioning center asks the cellular system, GSM in the embodiment, for the mobile position.

5. The cellular system sends out a request to the mobile.

25 6. The position is sent back to the cellular system.

7. The cellular system hands over the position information to the positioning center.

8. The positioning center calculates the position and sends the information to the MDR.

30 9. The MDR finds out from the position and the settings in the personal profile where "B" would like to have the mail sent and sends the mail to that address.

10. The MDR also sends an SMS to "B" for notification.

35 11. The SMS is sent to the mobile.

12. "B" responds with an SMS that he will read the mail.

13. The SMS is sent to the MDR.

14. "B" is connected to the Internet via PSTN.

5 15. "B" fetches the mail via PSTN.

16. The SMS is converted to a mail and sent to the mail server.

17. "A" reads the confirmation mail.

10 A second embodiment of the method according to the invention, wherein an email is sent from one station and is received in a mobile station, i.e email to mobile email, is described in connection with FIG 3.

15 1. "A" sends a mail to "B".

2. A request is sent to the MDR to find out where "B" is.

3. The MDR sends the position request to the positioning center.

20 4. The positioning center asks the cellular system for the mobile position.

5. The cellular system sends out a request to the mobile.

6. The position is sent back to the cellular system.

25 7. The cellular system hands over the position information to the positioning center.

8. The positioning center calculates the position and sends the information to the MDR.

30 9. The MDR finds out from the position and the settings in the personal profile that "B" would like to have the mail pushed (WAP) via SMS to the mobile phone.

10. The MDR sends the mail to the cellular system.

11. The mail is sent to "B".

Hence, the fundamental functions for MDR are message routing and message confirmation.

The purpose of message routing is to locate a person and automatically send messages to the most suitable and reachable communication device or address.

The intelligent routing decisions are made with the knowledge of the geographical position of the end user, type of message, the profile of the end user, i.e. concerning device usage and messages of interest, calendar information, address book information and profile data, see FIG 1.

The profile is composed of the following elements and the relations between them: Filters for incoming messages. Message type/size, priority of messages, communication devices and their identification numbers, geographical location of fixed communication devices, and routing rules using position, message type and size, sender etc in the premises to make conclusions.

The positioning function is used to locate an end users current location.

The position of cellular mobile devices, GSM (GPRS) devices in the embodiment, and/or GPS position data or another positioning system are used to locate an end user. The position data is received from the positioning system by means of PDE (Position Determining Equipment), MPC (Mobile Positioning Center), GMLC (Gateway Mobile Location Center), SMLC (Serving Mobile Location Center) or any other position gateway.

The message function analyses the size and type of an incoming message.

There is a Calendar in MDR, which can be used to route messages different depending on "data" in the calendar.

There is an Address book in MDR, which can be used to make filters for incoming messages in the routing function.

The routing function uses inputs, described above, to make intelligent decisions about routing the message to the most suitable devices.

When the MDR has routed a message to an end user, the sender will always get a confirmation when the end user has received the message. This is performed by SMS and WAP techniques in the embodiment.

The end-user's personal profile is editable for the end-user, but the end-user just needs to update the personal profile once with the position of the PCs (work and home) or other terminals like TV set-top boxes and Videogame consoles.

An alternative embodiment of the invention is a computer program element or product directly loadable into the internal memory of a routing device with digital computer capabilities, wherein the program product comprises software code portions for:

determining the position of a predetermined mobile communication device connected to the network and available to a user, which is associated with the intended destination;

analysing the type and the size of the message; analysing a personal profile of the user stored in a node in the communication network for determining which one of a number of destinations available for the user, being the most suitable destination to route the message to, with respect to the position of the mobile communication device and the type and size of the message;

and routing said message to the most suitable destination, when said product is run on said apparatus.

It is to be understood that even though numerous characteristics and features of the present invention have been set forth in the description, together with details of the function of the invention, the disclosure is illustrative only and changes may be made in detail especially in

matters of the type of messages handled by the system,
within the scope of the invention defined by the following
claims.

CLAIMS

1. A method of routing a message sent from a source to an intended destination in a communication network, characterised by the steps of:

5 determining the position of a predetermined mobile communication device connected to the network and available to a user, which is associated with the intended destination;

analysing the type and the size of the message;

10 analysing a personal profile of the user stored in a node in the communication network for determining which one of a number of destinations available for the user, being the most suitable destination to route the message to, with respect to the position of the mobile communication device
15 and the type and size of the message; and

routing said message to the most suitable destination.

2. A method according to claim 1, characterised by
20 the further step of:

generating a confirmation for the source when the message is received at the destination.

3. A routing device for routing a message sent from a
25 source to an intended destination in a communication network, said routing device comprising interface means for connection to and communication with various electronic communication devices, characterised by

position data receiving means for receiving position
30 data for a predetermined mobile communication device connected to the network and available for a user being associated with the destination;

message receiving means for receiving messages of a number of various message protocols;

message analysing means for determining the message protocol and determining the size of the message;

profile analysing means for analysing a stored personal profile of the user and selecting one of a number
5 of available destinations being the most suitable destination to route the message to, with respect to the position of the mobile communication device and the type and size of the message; and

routing means for routing said message to the most
10 suitable device or address.

4. A routing device according to claim 3,
characterised in that said destination is an email address, a voice mail service, an SMS destination,
15 multimedia message service, SIP address, mobile address, or IP address.

5. A routing device according to claim 3 or 4,
characterised in that said interface means is connectable
20 to and adapted to communicate with electronic communication devices such as a mobile phone, a PDA, or a PC.

6. A routing device according to any of the claims 3-5, characterised in that said message receiving means is
25 adapted to receive messages, such as voice, email, SMS, multimedia, and voice over IP.

7. A routing device according to any of the claims 3-6, characterised in that said position data receiving
30 means is adapted to receive GSM- or GPS-position data by means of a position gateway, such as PDE, MPC, GMLC, or SMLC.

8. A routing device according to any of the claims 3-7, **characterised** by an electronic calendar for storage of calendar information associated with the personal profile, which affects the routing of messages.

5

9. A routing device according to any of the claims 3-8, **characterised** by an electronic address book associated with the personal profile for filtering messages in the routing of messages.

10

10. A routing device according to any of the claims 3-9, **characterised** in that said profile comprises message type/size, priority of messages, addresses and devices, communication devices and their identification numbers and bandwidth, geographical location of fixed communication devices, and routing rules using position, message type and size, sender etc in the premises to make conclusions for routing messages.

20

11. A system for routing a message sent from a source to an intended destination in a communication network, **characterised** by

positioning means for determining the position of a predetermined mobile communication device connected to the network and available for a user, which is associated with the intended destination;

routing means for determining the message protocol and the size of the message, and analysing a stored personal profile of the user and selecting which one of a number of destinations available for the user, being the most suitable device to route the message to, with respect to the position of the mobile communication device and the type and size of the message; and

means for routing said message to the most suitable destination.

35

12. A system according to claim 11, **characterised** in that said destination is an email address, a voice mail service, an SMS destination, or multimedia message service.

5

13. A system according to claim 11 or 12, **characterised** in that said destination is a mobile phone, a PDA, a PC or an address.

10

14. A system according to any of the claims 11-13, **characterised** in that said message is a voice-, email-, SMS-, or multimedia-message.

15

15. A system according to any of the claims 11-14, **characterised** in that said positioning means is a GSM- or GPS-positioning system.

20

16. A computer program product directly loadable into the internal memory of a routing device with digital computer capabilities, **characterised** by comprising software code portions for performing the steps of claim 1 when said product is run on said apparatus.

25

17. A computer program element comprising: computer program code means to make a routing device with digital computer capabilities execute the steps of claim 1.

30

18. A computer program element as claimed in claim 17 embodied on a computer readable medium.

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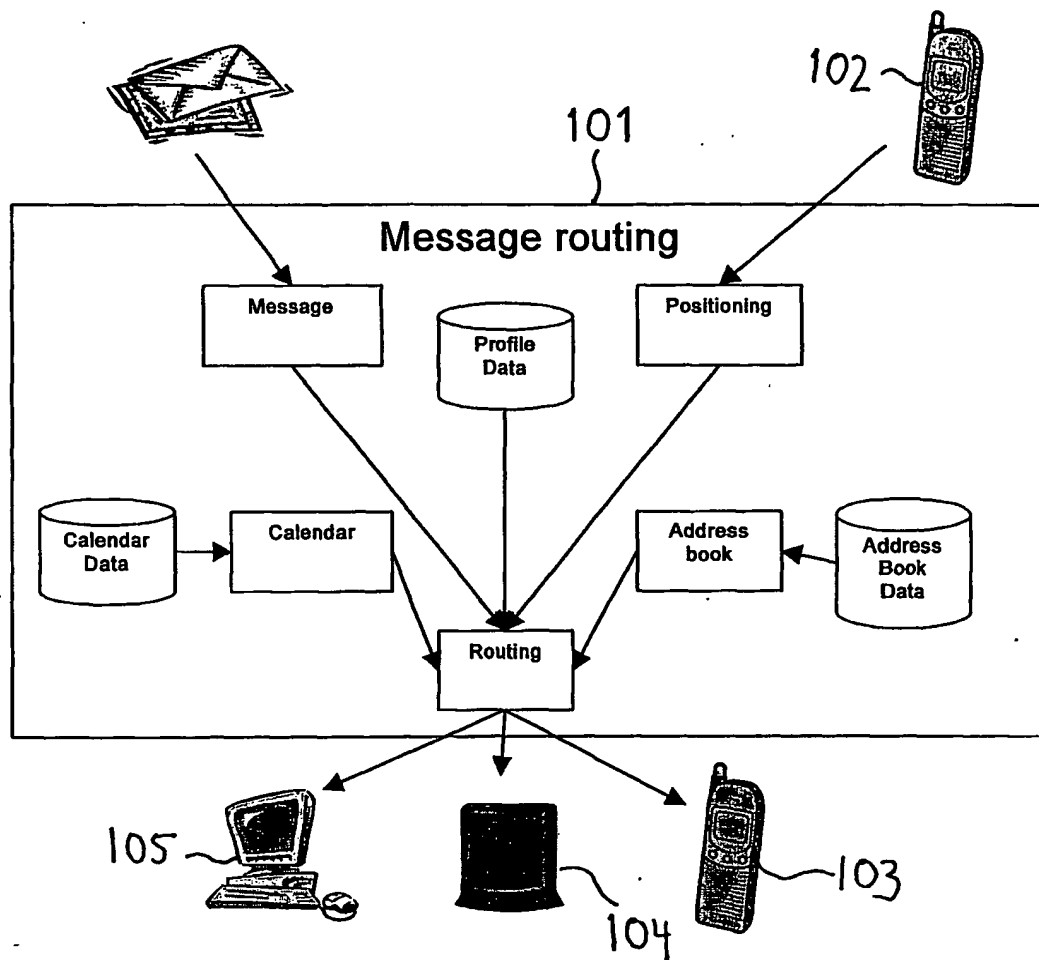


FIG 1.

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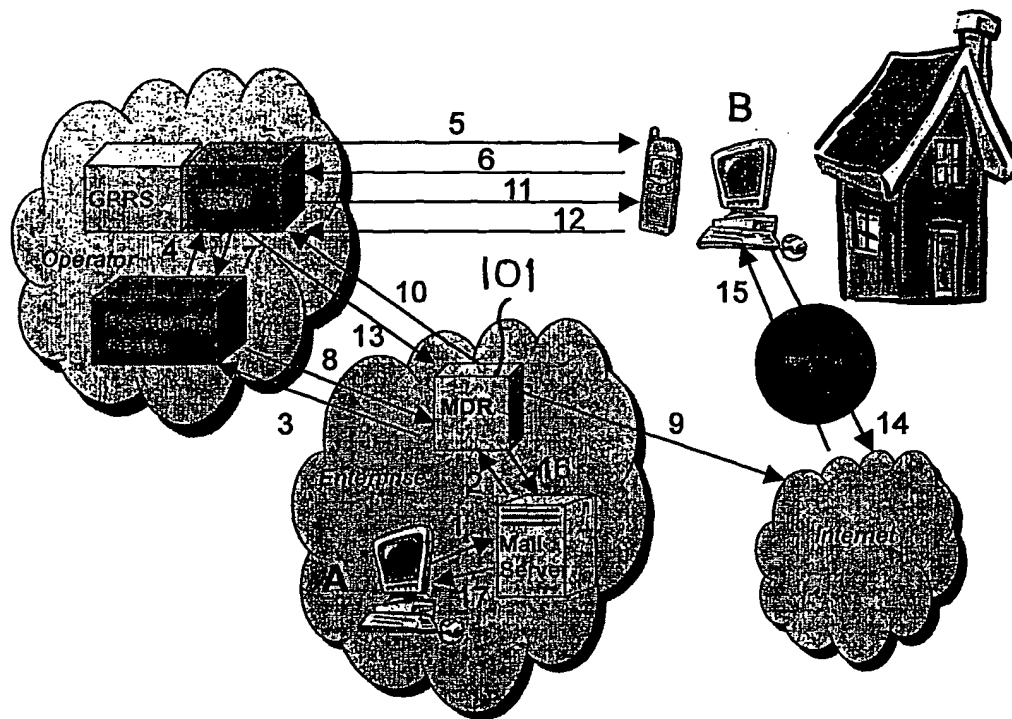


FIG 2.

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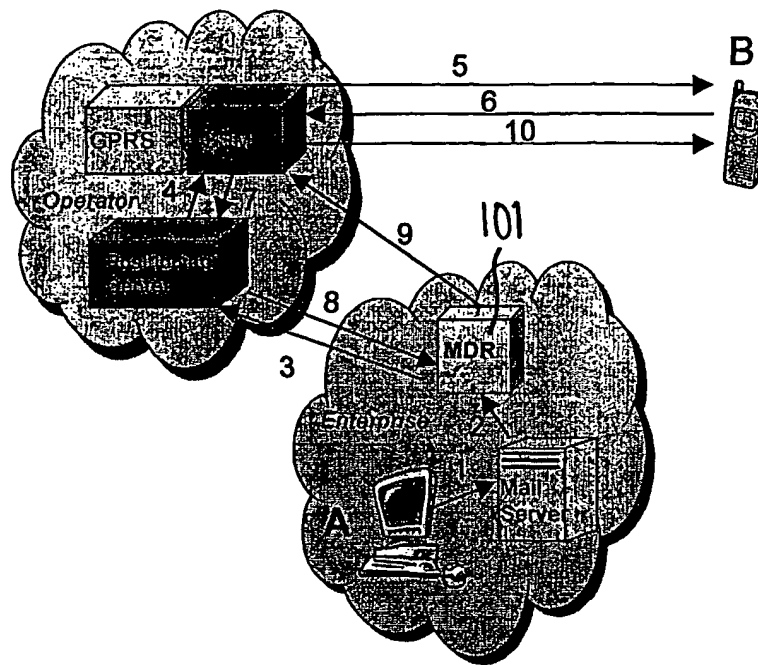


FIG 3.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 01/02327

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04L 12/56, H04Q 7/38, H04L 12/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04L, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI DATA, EPO-INTERNAL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6104712 A (ROBERT, B.G. ET AL), 15 August 2000 (15.08.00), claims 1-23, abstract --	1-18
A	US 6091959 A (SOUISSI, S. ET AL), 18 July 2000 (18.07.00), the whole document --	1-18
A	EP 0822728 A2 (LUCENT TECHNOLOGIES INC.), 4 February 1998 (04.02.98), claims 1-20 --	1-18
P,A	WO 0124559 A1 (OY RADIOLINJA AB), 5 April 2001 (05.04.01), claims 1-26, abstract --	1-18

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

17 January 2002

Date of mailing of the international search report

28-01-2002

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INTERNATIONAL SEARCH REPORT
Information on patent family members

06/11/01

International application No.

PCT/SE 01/02327

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
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